

REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks.

Claims 15-20 and 25-44 were pending in this application. Claims 1-14 and 21-24 have been withdrawn from consideration as directed to non-elected inventions. In this Amendment, claims 15, 25, 36, and 38 have been amended. No claims have been added or canceled. Accordingly, upon entry of this Amendment, claims 15-20 and 25-44 will be pending.

In the Office Action mailed August 3, 2007, the formerly issued restriction requirement was made final. The rejections of claims 17 and 19 under 35 U.S.C. § 112, claims 15-16 under 35 U.S.C. § 102(b), and claims 17-20 under 35 U.S.C. § 103(a) were withdrawn in view of Applicants' Amendment. Claims 15-16, 32-37, 18-19, 25-27, 29-31, 38-40, and 42-44 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,670,273 to Velasquez et al. ("Velasquez") in view of U.S. Patent No. 5,888,672 to Gustafson et al. ("Gustafson"). Claims 17, 20, 28, and 41 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Velasquez in view of Gustafson and further in view of U.S. Patent No. 6,136,476 to Schutts et al. ("Schutts"). Claim 36 was objected to because of an informality due to a misspelling.

Rejection Of Claims 15-16, 18-19, 25-27, 29-31, 38-40, And 42-44 Under 35 U.S.C. § 103(a)

The rejection of claims 15-16, 18-19, 25-27, 29-31, 38-40, and 42-44 under 35 U.S.C. § 103(a) should be withdrawn because the portions of Velasquez and Gustafson relied upon to

support the rejection fail to teach, either explicitly or inherently, or to suggest, the complete combination of elements recited in rejected independent claim 18 and now amended independent claims 15, 25, and 38.

In particular, in this Amendment, each of independent claims 15, 25, and 38 have been amended to recite substantially the same feature already recited in claim 18, wherein an electrolyte solution comprising a soluble polyimide, a lithium salt, and from about 10% by weight to about 60% by weight of solvent is prepared by first preparing a precursor electrolyte solution comprising about 70% to 95% solvent and thereafter partially drying the solution to evaporate a portion of the solvent. As discussed in the specification at, for example, page 14, last full paragraph, the high solvent concentration in the precursor solution aids in proper mixing of a polymer and salt. Subsequent partial drying produces an electrolyte having, for example, about 30% solvent concentration, that leads to a separator with adequate mechanical properties and charging capacity.

In light of the present Amendment, in which amended claim 15 now recites similar steps to claim 18, in the remarks below, Applicants will address at the same time the differences between the teachings of the cited art and the subject matter recited in amended claim 15 and claim 18. The claimed process in both claims thus involves: (1) a high initial fraction of solvent (70-95%); (2) a substantial decrease of solvent fraction; and (3) a substantial portion of solvent still remaining (10-60%) after evaporation. As will be discussed below, at best, Velasquez discloses item (1).

As an initial matter, Applicants note that, in rejecting claim 18, the Examiner asserts that Velasquez teaches some components of the recited step, namely drying the (electrolyte) solvent to evaporate the solvent to form an electrolyte separator. No portions of the text of Velasquez are cited specifically to support this assertion. Thereafter, the Examiner acknowledges that Velasquez does not explicitly disclose any specific electrolyte solvent composition for the electrolyte after a portion has been evaporated out.

The Examiner relies instead upon what appears to be an inherency argument, namely, that the curing process inherently leads to a solvent loss. The Examiner specifically appears to assert that the portions of Velasquez that discuss curing polymers entails a process that would cause solvent to evaporate during the curing, thus leading to a lower solvent composition in an electrolyte. Somehow this inadvertent solvent loss is asserted to read on the claim limitation. In contrast to the claims of this application, this assertion by the Examiner of the occurrence of solvent loss during curing is not quantified. There is no suggestion as to any desired quantifiable range of solvent loss.

Applicants respectfully submit that whether inadvertent solvent evaporation would occur during a polymer curing, this conjectured implied result, together with the explicit teachings of Velasquez, hardly meets the limitations recited in the independent claims of this patent application. At most, Velasquez discloses that the electrolyte solvent compositions can be high (Velasquez discloses up to 80%), but fails to teach, inherently disclose, or suggest features (2) and (3), namely, a substantial reduction in solvent composition that results in a still substantial remaining fraction of solvent after the evaporation. For example, when discussing the solvent

composition of the electrolyte for cases where solvent is retained, Velasquez notes that, although variable, the most preferable composition is about 70 weight percent solvent. (Column 8, line 45.) Velasquez is silent as to whether this composition is an electrolyte composition before or after any curing process. No discussion takes place as to a method for reducing the solvent composition to the claimed 10-60% solvent range. No discussion of lowering the solvent composition to another composition takes place at all.

Moreover, whether one of ordinary skill at the time of the invention might recognize that some solvent loss is possible during the polymer curing taught by Velasquez, there is no suggestion in the teachings of the cited art as to the desirability of producing compositions in the range of resultant solvent composition recited in the pending claims.

Specifically, one of ordinary skill in the art at the time of the invention, when considering the polymer electrolyte of Velasquez, would have no reason to appreciate the desirability of controlled solvent reduction to produce an electrolyte separator comprising from about 10% by weight to about 60% by weight of solvent, as recited in the claims, because known electrolytes were capable of satisfactory operation without any solvent at all.

As appreciated by *Applicants* and illustrated in Figure 2 of this application, if a solvent composition in a *polyimide*-based electrolyte separator is controlled within a specific range, a surprisingly beneficial combination of good mechanical properties of the separator and good charging properties of the polyimide-based battery is obtained. This range is about 10-60% solvent for the claimed polyimide electrolyte separators of the independent claims, and in some embodiments (claim 37) about 20-40% solvent. The recited method first recites that an excess of

solvent be employed, followed by evaporation of a controlled portion of the solvent to produce the separator having the desired solvent composition range.

However, Velasquez is not directed toward polyimide-based batteries (Velasquez, for example, discloses fluoropolymer-based solid electrolytes). As discussed in the background section of the present application, non-polyimide batteries, such as those using polyethylene oxide, were known to be capable of satisfactory operation, both in terms of charging and mechanical stability as solid electrolytes without solvent.

Nor can Gustafson cure the deficiencies of Velasquez with respect to the limitations recited in claims 15 and 18. Gustafson discloses polyimide-based electrolytes, but teaches a method for fabricating dry electrolytes with the solvent completely removed. One of ordinary skill in the art at the time of the invention, contemplating the teachings of Velasquez in view of Gustafson, would thus be led away from the invention recited in amended claims 18 and 15. The same applies for independent claims 25 and 38, which recite substantially the same limitations discussed above with respect to amended claim 15.

Applicants therefore respectfully request that the rejection of independent claims 15; 18; 25; and 38, and respective dependent claims, 16 and 32-37; 19; 26-27, 29-31; and 39-40 and 42-44, under 35 U.S.C. § 103(a) be withdrawn.

Rejection Of Claims 17, 20, 28, And 41 Under 35 U.S.C. § 103(a)

At least for the reasons stated above with respect to their respective independent claims, claims 17, 20, 28, and 41 are patentable over Velasquez in view of Gustafson. Nor does the biface cell of Schutts address this deficiency. Accordingly, the rejection of claims 17, 20, 28,

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and 42 under 35 U.S.C. § 103(a) as being unpatentable over Velasquez and Gustafson in view of Schutts, also should be withdrawn.

In view of the foregoing, all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone applicants' undersigned representative at the number listed below.

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Respectfully submitted,

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